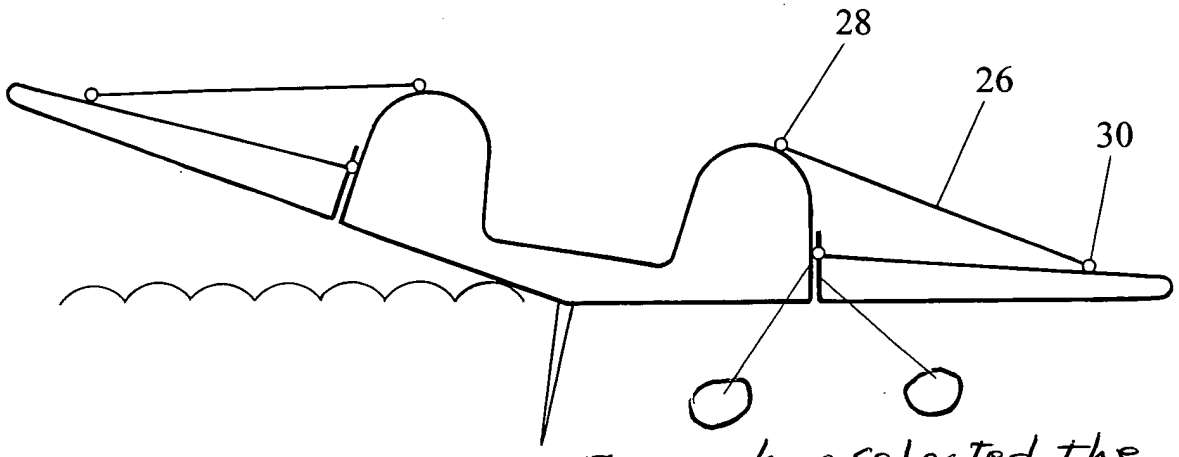

Fig. 7

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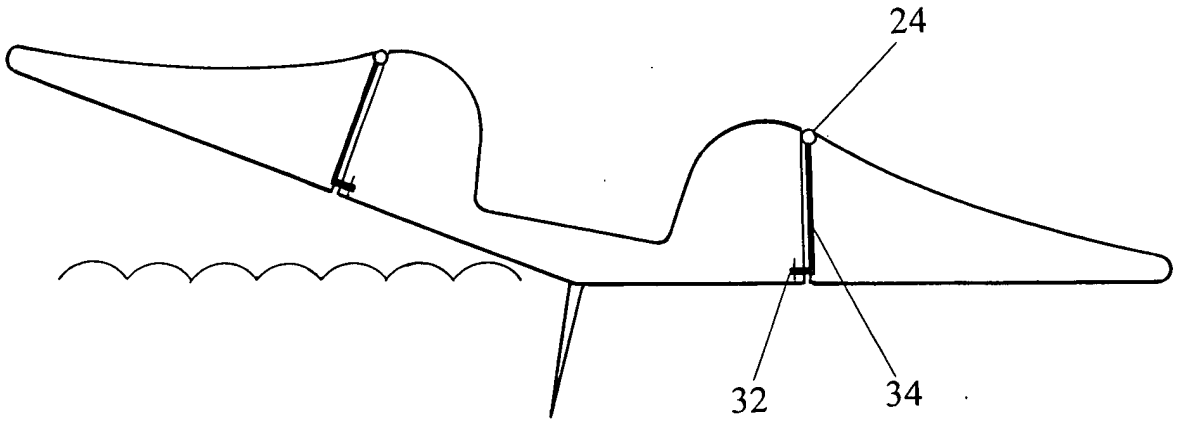

Fig. 8

seat may not provide a comfortable ride for crewmembers. Therefore, Fig. 10 shows a lowered hinge axis while still maintaining moderate attachment loads. The hinges on the hull side could be attached to bars that extend down to solid body mounts through slots in the wing and its hinge plate **34**. These curved anchors would not be exposed when the wing is deployed for sailing. The wing root hinge plate in both Figs. 9 and 10 is drawn as a segment of a fixed radius tube. As shown in Fig. 6, the flared seats converge forward with a straight line of sight that accommodates the straight hinge line. Then the slice of the tubular hinge plate will narrow forward to accommodate the seat thickness. In Fig. 10, the retracted wing will rest on the cockpit floor. But since the hinge line converges forward, most of the wing tip will recline over-center by up to one foot. This is a reasonable solution if it is considered acceptable for the second wing to lap over to lie on top of the first, and there is also a practical solution for folding the tiller. In Fig. 9, a rod retracted from the floor or transom could support the raised wing and this same arrangement could be used for a wing of Fig. 10 in a crowded mooring or against a dock, using complete folding only for road travel.

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[69] The folding wing version of Fig. 6 with its low hinge line allows easier paddling at a launch site and is more convenient as a platform for picnicking, fishing or for resting than those of Fig. 9 or Fig. 10. However, it will need some innovations for water sealing of the hinge line at the floor pivot location and for the support and folding mechanism.

SAIL AREA

[70] Determining sail area must begin with defining the sailing conditions which will subject the wings to their greatest stresses allowable while maintaining the boat upright, since there will be some sail size that will be capable of rolling the boat over in high winds. When sailing on a reach where the induced roll force is very large, the helmsman and other crew will be seated on the windward side where they can observe the status of the leeward wing. The boat will be heeled and maintained at the wing dihedral angle, keeping the wing flat on the water without lifting the aft end of the hull or submerging the wing tip. This will allow the maximum sailing speed for the wing-hull design for whatever wind and water condition that exists, and it will also impose the design loads and stresses on both wings. Having an excess sail area above that required for attaining maximum speed may be beneficial at other

TWISTER WINGS SAILBOAT

ABSTRACT

Two fixed, tilted-up wings (22), (Fig.1), (Fig. 5) attached at or above the water line along the aft rails of any monohull sailboat (20) will serve the dual functions of being an outboard platform for the crew on the windward side and when the boat heels enough to bring the leeward wing to the water, the design presents the wing at the proper entry as an efficient hydrodynamic lifting body planning the surface. Both wings reacting simultaneously outboard of the hull, one weighted down and one lifting up, produce a magnitude of restoring moments which will accommodate a very large sail area that will increase the potential for high speed sailing, as well as for sailing in lighter winds when both wings are held clear of the water

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